A tale of two inventions

Radiofrequency ablation catheter system.
Balloon ablation of the pulmonary veins.

Jonathan Langberg, MD
Professor of Medicine
Director, Section of Cardiac Electrophysiology
Interventional Cardiac Electrophysiology, 1988

DC Shock ablation limitations

- General anesthesia
- Barotrauma
- Not titratable
- Early recurrences
Advantages of RF ablation

• Track record of use in oncology, neurosurgery, and GI endoscopy.

  J J Langberg, M C Chin, M Rosenqvist, J Cockrell, N Dullet, G Van Hare, J C Griffin and M M Scheinman
  Catheter ablation of the atrioventricular junction with radiofrequency energy.

• Painless – no general anesthesia required.

• No barotrauma.

• Both power and duration can be adjusted, allowing titration of dose.

• Thermal effects are stable – late recurrence rare.
RF ablation system

- Large distal electrode to increase contact area and lesion size.
- Deflectable shaft to facilitate catheter placement and contact force.
- Temperature monitor incorporated into the catheter tip.
- Power supply with temperature feedback control of power output.
- Automatic shutoff for sudden rise in impedance due to overheating.
The EPT-1000™ Cardiac Ablation System was introduced in 1994 by EP Technologies. It was the first temperature-monitoring cardiac ablation system approved by the FDA. These devices are used to treat people living with various cardiac arrhythmias—a condition that afflicts well over two million Americans—by delivering radiofrequency (RF) energy via an ablation catheter to render the heart's abnormal sites electrically inactive. Still a market leader today, the EPT-1000 RF Systems are used in more than 80 percent of electrophysiology labs across the United States.
Catheter ablation of atrial fibrillation
CIRCUMFERENTIAL ABLATION DEVICE ASSEMBLY

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Assignee: Atrionix, Inc., Palo Alto, CA (US)
Ultrasound balloon catheter for AF
Atrionix, Inc

- Founded: 1/97
- 1st patent filed: 7/97
- Prototype tested: 3/99
- A-round of financing: 8/99
- B-round of financing: 9/00
- Animal study published: 12/00
- End of IDE phase 1: 9/00
- Acquired by J&J $62m: 12/00
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- Acquired by J&J $62m: 12/00
- Freezor max FDA approval: 12/10
Suggestions for Physician Inventors

• Ideas that are 2-5 years ahead are the best.
• Do your own pubmed and patent search.
• Draft your own provisional patent before seeing patent counsel.
• Use NDAs before discussing your invention.
• Don’t get maternal about your idea.
Truisms for Physician Inventors

• The size of the baby is proportional to the amount of gestation.
• Companies don’t succeed unless someone’s future depends on it.
• Physician founders are often considered liabilities after the formative phase is over.
• Even very simple proofs-of-concept add great value to a start up.